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Non-Profit Law and Consulting in Conservation of Natural Resources and the Global Environment

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September 22,1999

Dear Lester:

Please consider this letter and the attached comments and documents as NHI's comments to the CALFED programmatic EIR/EIS document.

NHI's primary concern is that the document fails to explore an adequate range of feasible alternatives for several components of the plan. Alternatives that would better achieve all four of the specified objectives of the CALFED Program are described in these comments. NHI's report, "An Environmentally Optimal Alternative for the Bay-Delta Ecosystem: A Response to the CALFED Program" outlines a far more expansive vision of the actions necessary to achieve all of CALFED's objectives. We are submitting a copy of the EOA as part of our comments to the EIR/EIS. In addition, we are resubmitting our comments to the initial draft of the ERPP from 1997 as comments to the EIR/EIS since they are still relevant.

In several places, we have delineated questions in italics. Please ask your staff to respond to these questions in the final EIR/EIS.

Thank you for consideration of these comments. We are committed to the success of this Program and trust you will find our critique constructive and helpful in advancing that goal.

Yours sincerely,

Gregory A. Thomas

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COMMENTS OF THE NATURAL HERITAGE INSTITUTE TO THE CALFED PROGRAMATIC EIR/EIS

September 22, 1999

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A. Long-Term Levee Protection Plan

The organization, clarity, and substance of the levee protection plan are a tremendous improvement over previous drafts. NHI staff commends CALFED staff for this progress. Nevertheless, NHI remains concerned that the Levee Protection Plan underestimates both the magnitude of the seismic risk problem and the opportunity for solving this problem through subsidence reversal programs. Our most fundamental concern at this juncture is that CALFED has not quantified the costs and benefits of various levee program alternatives, including the costs to California's economy, environment and water supply from catastrophic levee failure. It is possible to determine the most cost-effective and reliable means of reducing levee system vulnerability or to select the preferred alternative until this analysis is completed.

Executive Summary

In the Executive Summary of the levee section (ES-5) and two other places in the document (Pg 2-17; pg; pg. xx) CALFED incorrectly misquotes and misrepresents the seismic team report with the following quote: "Significant seismic risk is present; however, improved preparedness can reduce the potential damage." *What is the basis for this conclusion?* It is true that the study opines that significant improvements in emergency response capability would increase the number of failures that could be withstood and repaired within a given time-frame (e.g. within six month, or within a given water season). But this does not eliminate a high probability of catastrophic failure

of the delta levee system from seismic events with the next few decades. The Executive Summary and levee plan simply ignores the alarming conclusion that:

> "Simple levee upgrades currently being considered to improve static stability (e.g. PL84-99 upgrades) are largely ineffective at reducing seismic fragility. These types of "static" upgrades will do very little to reduce the risk of levee failures associated with soil liquefaction, and are unlikely to reduce the exposure levels shown in Figures 5-2 and 5-3 by more than about 10% (almost no change in seismic exposure)" (Pg. 30).

Figure 5-3 illustrates that there is a 35% probability of an earthquake causing 10 or more levee breaches in the next in the next 50 years. The study team leader, Dr. Raymond Seed of the University of California at Berkeley, has informed us that 6-12 levee breaches in a single event would probably overwhelm the feasible level of standby emergency capabilities such that key western Delta islands (Seed, pers. com, 1999) would be inundated for an indefinite period of time, effectively compromising the Delta as a water delivery system. With regard to emergency preparedness, the report states (pg. 31) that "at the present time, the ability to respond to more than a limited number of levee failures following a seismic event is probably very limited."

To illustrate, consider the following scenario:

30 years from today, a moderate earthquake in the Delta region causes 10 simultaneous levee breaches (a 20% probability). Assume that each levee breach is an average of 500 feet long, 200 feet wide, and 50 feet deep (including scour) with a volume of 5,000,000 cubic feet (185,000 cubic yards). Together, the ten breaches 1,850,000 cubic yards of fill in a short period of time (3-6 months or less) would be necessary to repair the breaches[1]. A comparison of this number to historical dredging rates reveals the true magnitude of this number. For instance, according to a report by Phillip Williams and Associates (table attached) Delta dredging to upland disposal averaged 500,000 cubic yards per year between 1975 and 1987. Thus, an emergency response effort would have to move nearly 4 times the annual average in a quarter to half the time (3-6 months). This would presumably require 8 to 16 times the number of barges and other equipment and labor that were available during the 1975-1987 period. This does not include the considerable resources that will be simultaneously required to repair damaged levees in danger of imminent failure. *Where will CALFED assemble these resources? Does CALFED intend to maintain a fleet of barges for the indefinite future? How much will this cost and how does it compare to the costs of reversing subsidence on key Western Delta islands.*

CALFED's Executive Summary ignores these alarming conclusions and downplays the seismic risk to the levees and levee dependent systems. If the levee system fails,

[1] The backside of the levees could erode beyond repair in less than 3-6 months unless extraordinary measures are taken to line the backside of the levees with plastic. Even these measures may not be sufficient in the event of high winds common in the Delta. In reality, 1-2 months is a more conservative window for repair.

CALFED fails. This EIS/EIR will remain unsatisfactory on this issue until it does two things:

1) Acknowledges and quantifies the full dimensions and consequences of the seismic risk and analyzes its implications for the choice of the other CALFED program elements, including delta conveyance alternatives, levee plan, water quality proposal, and ecosystem restoration strategy.

2) Seriously explore and describe a program for reducing or eliminating the seismic risks through subsidence reversal techniques. Specifically, we propose that CALFED commit to expend no less on learning how and where to reverse subsidence than it is planning to spend on levee maintenance over the life of the plan.

Specific Questions:

CALFED claims in the subsidence section (pg. xix) that the Delta must remain in its current configuration if CALFED is to achieve its objectives for water quality, ecosystem restoration, and levee system integrity. *What analysis has CALFED performed to support this assertion? How does CALFED define the current configuration of the Delta? Does CALFED consider the subsided configuration of the Delta islands desirable? Is it possible that some cut-off and set-back levees that would change the configuration are desirable? Did CALFED analyze the impacts of other Delta configuration alternatives on water quality, ecosystem restoration, and levee system integrity? How does CALFED define "current configuration?"*

Page xix states, "over the last 25 years, the existing levee program has demonstrated that levees in the Delta can be stabilized." Over the past 20 years, more than 25 levee failures have occurred on at least 15 Delta Islands and tracts.[2] The seismic report (appendix g) estimates a 25% probability of 10 simultaneous levee breaches in the next 50 years, and concludes that CALFED plans to upgrade all Delta levees to PL84-99 standard would not significantly reduce levee vulnerability." As few as 6-12 levee breaches may result in irreparable damage to the Delta Levee system (Seed, pers. com. 1999). *Does CALFED consider a levee system with a 25% chance of irreparable failure stable? Does CALFED have a plan for reducing the probability of delta levees from the dynamic loads created by seismic shaking?*

Page xix states, "In most cases, however, subsidence reversal is not implementable – due to excessive costs, right-of-way acquisition, land use conversion, and political concerns." *Has CALFED staff conducted any analysis or produced any documents regarding the cost or feasibility of subsidence reversal? If so, did these analyses compare the cost of subsidence reversal to the costs of catastrophic levee failure?* NHI has conducted and published analysis regarding the issues of cost, right-of-way acquisition, land use conversion, and political concerns associated with subsidence reversal. These analyses

[2] DWR, Delta Atlas, pg. 48.

are included in the attached report, "An Environmentally Optimal Alternative for the Bay-Delta Ecosystem: A Response to the CALFED Program" (NHI 1998). Briefly, the report concludes the best place to focus subsidence reversal is in the Western Delta where levees and water supply are most vulnerable to seismic failure. Most of the Western Delta Islands are already in public ownership (Sherman, Twitchell, and Jersey Island) or are owned by private parties who intend to convert them in a manner consistent with subsidence reversal activities (Webb and Holland Tract). The remaining island, Bradford, is categorized as mostly idle with some pasture by DWR, and its owners are reputedly in financial distress and eager to sell. Most of the Western Delta islands (excluding Bethel) are utilized for low value agriculture such as pasture, hay, and corn. NHI and representative from the Delta protection commission and Delta water agencies developed a map of low conflict (political) restoration opportunities that includes most of the western Delta. Subsidence reversal will undoubtedly be expensive, but these costs will probably less than the cost to the California economy if the Delta islands fail (NHI 1999). In conclusion, both the land acquisition and conversion costs and local political opposition to subsidence reversal on the western Delta islands are minimal.

Chapter 4, Ecosystem Restoration Program/Levee Program Coordination: This section needs more work. Despite years of document preparation, CALFED has generated less than two pages on opportunities for integrating the ecosystem restoration program and the levee protection plan.

Section 4.2 includes numerous assertions that vegetation on levee surfaces either compromises levee stability, maintenance, and emergency repair. *Are these assertions based on scientific studies? Has CALFED reviewed the peer reviewed scientific literature on the interaction between vegetation and levees? If so, what sources were reviewed?*

The levee cross sections depicted in figure 6 do not increase the area or linear footage of tidal marsh habitat. Rather, they suffer on of the same drawbacks of existing levee designs, a preponderance of rip-rap along the water land interface. Nearly all the wetland vegetation is depicted as being significantly above mean sea level. CALFED should consider additional cross section designs that attempt to increase the amount of vegetation along the water/land interface. In particular, they should explore designs with a gentler slope to the water that is planted with wetland vegetation from approximately 3 feet below mean lower low water to mean higher, high water.

The plan fails to analyze the opportunities for cut-off and set back levees on mineral soils. There are an abundance of areas throughout the Delta, even in the central and western Delta, where bands of mineral soil are available to serve as foundation material for new or cut-off levees.

NHI welcomes the inclusion of appendix H detailing the maps of ecosystem restoration opportunities that NHI developed in collaboration with the Delta Protection Commission, representatives from the North, Central, and South Delta, Water Agencies. We must clarify, however, that these maps depict opportunities for ecosystem restoration – not

necessarily opportunities for integrating ecosystem restoration and the levee program as is stated on page 4-3.

B. Impact Analysis

Programmatic EIR/EIS

The probability of multiple levee failures that would overwhelm the best emergency response capabilities is approximately 10% over the next 20 years.[3] Such catastrophic levee failure would have major adverse impacts on the water supply, ecosystem, and water quality objectives of the program, yet there is no discussion of the risk and consequences of catastrophic levee failure for any of the alternative analyses. Pg. 6.1.36 claims erroneously claims that the Levee System Integrity Program would reduce the risk to the ecosystem of catastrophic breaching of Delta levees by maintaining and improving the integrity of the Delta Ecosystem. Alternative 3, and to a lesser extent alternative 2, would reduce much of the water supply and export water quality impacts of catastrophic levee failure, but none of the three alternatives would reduce the severe ecological and local water quality impacts that catastrophic levee failure would have on the Delta. The programmatic EIR/EIS should evaluate the risk and impact of multiple levee failures on water supply, Delta water quality, and the ecosystem health for all alternatives including the no action alternative.

Section 7.1 estimates that 151,800 acres of important farmlands could be converted out of agriculture as a result of the ecosystem restoration program. This is less than one quarter of one percent the 6,834,594 acres of important farmland identified in the ERP. When compared to the amount of farmland that is currently being converted to urban uses, this number is insignificant. Moreover, these numbers appear to greatly overestimate the amount of farmland that would be converted, particularly in the Delta. 33,500 acres of Delta lands are delineated as idle in DWR's land use survey while another 75,000 acres of lands are delineated as native. If ecosystem restoration occurs mostly on these lands, losses to agriculture will be small.

Section 7.1,7.2, and 7.3 fail to adequately consider the agricultural impacts of the no-action alternative. Without the CALFED program, particularly the levee program, 100,000 – 200,000 acres of agricultural land and corresponding jobs could be lost due to catastrophic levee failure. Another 100,000 – 200,000 acres would be idled due to the local water quality impacts of catastrophic levee failure. The EIR should consider these scenarios when evaluating the no-action alternative.

[3] These probabilities vary depending on how many simultaneous levee breaches would cause irreparable destruction of the levee system. 6-12 levee breaches may be irreparable (Ray Seed, Pers. Com 1999). The probability of 6-12 levee breaches in the next 20 years is approximately 10%.

Section 7.2 estimates that gross revenue losses would range from $500 to $1,500 per acre. Since majority of the land is in the Delta, and most of the other lands targeted for acquisition are riparian and wetland prone to flooding, it is unlikely that average revenues are above $500 per acre (from DWR land use statistics). As stated above, approximately 110,000 acres in the Delta, 16% of the legal Delta lands, are currently classified as idle or native. If a significant amount of restoration occurs on these lands, as is anticipated, than the average revenue loss per acre would decrease substantially. Another 56% of the Delta is classified as field crops (primarily corn), pasture, grain and hay (from DWR land use statistics). According to table 7.1-2 the gross revenue per acre for these commodities range from $108 to $570 per acre with a weighted average of $350 per acre. Most of the lands currently target for restoration are planted to these lower value uses, and the higher price of lands in other crops such as orchards will largely direct the restoration program away from higher value lands. Considering that 56% of the Delta acreage yields an average $350 per acre while another 16% of the Delta averages $0 per acre, the estimated range of revenue losses $500 to $1,500 is exaggerated. A more realistic figure would be $0 to $500 per acre. $500 to $1,500 per acre revenue loss estimates for the Sacramento and San Joaquin River regions also seems excessive. Considering that nearly half of Sacramento Valley land is in grain, alfalfa, field crops, or pasture with a gross revenue that ranges from $100 to $525 per acre, it is impossible that the average revenue loss per acre could reach an average of $1,500 per acre even if the other half of the lands were in orchard with a revenue of $2181 per acre (which they are not). Rather we estimate that an average revenue loss of $350 to $1,000 per acre is more accurate. Again the ecosystem program is going to be more likely to spend its money on low value land rather than high value orchards, resulting in a disproportionate amount of low value land being taken out of production.

7.3-13 uses number of up to 167 million revenue losses from agricultural conversion in the Delta. This number is based on an average revenue loss of $1,500 per acre which is two high based on the analysis presented above for section 7.2. Utilizing a more realistic figure such as $350 per acre would generate an estimated of $39 million in revenue losses per year. This section estimates a loss of approximately 11,000 jobs due to agricultural land conversion resulting from the combined restoration and levee programs, but does not consider the increase in jobs that would result from the $2-3 billion investment in these programs.

C. Water Transfer Program Plan:

P, 1-3: states "It is important to note that water transfers are simply **mechanisms to move** water and **not sources** of water." This is not entirely correct. To the transferee, water transfers are indeed a source of water. Indeed, for some urban water supply agencies and for some agricultural water agencies on the west side of the San Joaquin River, water transfers are now regarded as a component of their base annual supply. Perhaps the point the document seeks to make is that water transfers reallocate existing supplies; they do not make new water available to the system. Even this is not correct in two important respects:

- Water transfers can provide an important economic incentive against over-application of irrigation water. When that reduces evaporative losses or deep percolation of water to unusable groundwater basins (e.g., the drainage-impacted lands on the west side of the San Joaquin) or salt sinks (e.g., tail water losses to the Salton Sea from the Imperial Irrigation District), those saving represent water that would not otherwise we available for beneficial uses. This is important to acknowledge. Avoiding flows to salt sinks also have important water quality benefits. Facilitation of water transfers was a key mechanism cited by the interagency San Joaquin Valley Drainage Program (the "Rainbow Report") for reducing drainage problems at their source.

- Water transfers are also a key component of conjunctive use/groundwater banking programs, which do produce new water. One of the unexamined issues in the EIR/EIS is how water transfers can be improved for this purpose. We suggest that this issue be examined in the Integrated Storage Investigation.

P. 1-3: states "Water transfers . . . may encourage more efficient use of water . . .." Our empirical work on agricultural water conservation in the Central Valley confirms this statement. Indeed, it demonstrates why water transfers and other economic inducements like tiered pricing may be the best or only mechanism for improving efficiency of agricultural water use in the economic sense (i.e., a reduction in the amount of water consumed per unit of agricultural profit realized). This realization suggests that the facilitation of water transfers warrants greater prominence than it has received so far in the CALFED program.

P. 1-3: states "It is not a CalFed objective to increase the economic efficiency of water in the sense of causing water to move from relatively lower value uses to relatively higher values uses per unit of water ..." But it is a CALFED objective to improve water supply reliability. The role of water transfers in accomplishing that objective—in part by moving water from lower value uses to relatively higher value uses per unit of water—is not analyzed in the EIR/EIS. Yet, conservation options of this sort will need to be part of the Integrated Resource Plan (of which the ISI is a only a part) to satisfy the requirements of NEPA/CEQA/CWA §404 for consideration of a reasonable range of alternatives. What if half of the 20% of irrigation water that now produces only 4% of farm product were transferred to meet supply deficiencies in high valued crops, urban supply systems and instream flows? That could result in a substantial increase in supply reliability for every sector, including agriculture. How could a water transfer system that could tap that potential be put in place? No such scenarios have been generated or examined so far by the CALFED Program.

P. 1-5: states "water transfers can provide financial incentives for efficiency improvements, which can generate transferrable water in some instances. For example, . . . back in production." Indeed. Yet, this paragraph hides a big problem in generating transferrable water: that is, in most areas of the Central Valley, the most readily available methods for conserving water—on-farm conservation measures and lining of canals--will not generate transferrable water. In the areas where excess irrigation applications return

to usable surface or groundwater systems, it appears that the only ways to generate transferrable water are by fallowing land (which is not desired by agriculture), by reducing evaporation losses (e.g., shifting from sprinkler to drip irrigation) or by shifting to crops with lower applied water requirements. Eliminating deep percolation or recapturing tail water will not give rise to marketable water, at least under the CVPIA water transfer rules.

This "consumptive water" or "no injury" limitation to water transfers is a sound result where the source of the water and the place of application are hydrologically connected. But the result is not sound where the water is "imported" into the area of application.[4] See the next comment for an elaboration of this point.

P. 3-9: states "The other view argues that . . . groundwater basin results": As a proponent of "the other view", we should clarify our position. We propose integrating groundwater management into the surface water management system. We argue that "imported" irrigation water that percolates to usable groundwater, as contrasted to "native" or "area of origin" water, should be transferrable on either a short-term or long-term basis. This is because state common law recognizes that an importer of water retains the right to recapture the deep percolation or return flow. Thus, an importer does not lose control of imported water to other water users, but can take measures to recapture and reuse that water or transfer it to others. The federal water transfer rules, however, abrogate this distinction and treat imported water as though it were native water for purposes of the "consumptive use" and "no injury" limitations on water transfers. This is ironic since the very purpose of the CVP is to make water available in service areas where it would not otherwise be.

At present, groundwater users who are pumping within the service areas of the federal and state projects are obtaining a "windfall" in the form of groundwater recharge from irrigation applications. They receive this developed water without charge and to the detriment of potential transferees of that same water. Stated another way, groundwater pumpers who have enjoyed the benefit of incidental groundwater recharge from the over-application of imported irrigation water by the CVP or SWP are not "legal users" of that water in the event that the importer (the projects or their contractors) undertake measures to reduce that incidental recharge. Those farmers or water districts that implement irrigation improvements or water conservation measures in these areas should be allowed to market the saved water. Indeed, unless they can do so, it is hard to see why they would incur the costs of implementing those measures.

How would the water supply reliability picture change if this incidental groundwater recharge were instead reallocated to willing buyers either within or outside of those service areas? Under that scenario, groundwater pumpers would not necessarily lose the

[4] The functionally relevant meaning of "imported water" is water that would not otherwise have been hydrologically available at the point of extraction. It does not mean only water that has been diverted from one drainage basin to another. Thus, water released from Shasta for storage in the Yolo Basin is probably "imported water".

use of the incidental recharge water from the state and federal projects, but they would have to pay for it like the surface water users do. That increase in cost would induce and justify larger investments in water conservation measures by these users and reduce the draw on aquifer supplies in drier years when that water is most needed by other users in the system. This type of integration of surface and groundwater uses is exemplified by the Arvin Water Storage District in Kern County.

We think the CALFED program should look seriously at these relationships between water transfers, groundwater management and water conservation and how they relate to the (dry year) water reliability objective of the CALFED program. That inquiry is central to the potential role of water transfers within the CalFed solution set. The final PEIS/EIR should consider this water management alternative, including an analysis of how changing the federal rules to allow transfer of recaptured deep percolation and return flow would improve incentives to conserve water for other uses.

P. 2-5: states "The federal . . . to any other California water user": As noted above, this summary of law should analyze how the limitations on transferrable water in the CVPIA limit the usefulness of water transfers in accomplishing the objectives of the CALFED program. Specifically, the inability to transfer salvaged deep percolation water may be a problem. This summary of the law should also discuss the distinction between native and imported water as it affects water transfers.

P. 4-8: states "4.4.3 Solution Process . . . Issues": Legislation to create an instream flow registry to protect environmental water transfers was developed by NHI in 1995 with the support of ACWA and MWD. That bill was twice passed and twice vetoed by Governor Wilson. The Governor supported the measure but vetoed the bill because the cost of administering the program by the SWRCB was not in the Governor's budget requests. Please include NHI in the proposed discussions among "stakeholder representatives and CALFED agency representatives" on this issue "during the months prior to a Record of Decision". We have accumulated substantial experience on this problem and the options for dealing with it.

D. Water Use Efficiency Program

NHI supports the intent of CALFED to invest in urban and agricultural efficiency as part of its program to meet multiple needs, and we find this section to be much improved. However, three conceptual problems remain. First, CALFED must assure that efficiency investments assist in meeting CALFED goals. Subsidies for water conservation initiatives that are not linked to a tangible benefit for the CALFED program are likely to be ineffectual and wasteful. Second, CALFED limits the potential for agricultural efficiency improvements by defining efficiency in purely physical rather than economic terms. Third, CALFED fails to appreciate the larger role that water conservation can play in improving dry year water supply reliability when it is coupled to inter-annual storage arrangements such as groundwater banking.

Moving from subsidies to investments: Linking payments for water conservation to tangible water supply and water quality benefits requires CALFED to create market incentives for water conservation initiatives. This can be done in two ways. To the extent that CALFED "enters the market" to purchase water for environmental purposes (through the EWA), the market value of water will be increase. This makes it worthwhile for local water users and suppliers to spend more to conserve or recycle water that would otherwise be lost to beneficial uses. As a second technique, CALFED can enter into ventures or joint ventures to actually invest in conservation or recycle projects in exchange for all or a portion of the water that will be generated.

As a prime example, consider what could happen if CALFED were to fund efficiency programs in urban southern California. If CALFED simply hands out subsidies for efficiency improvements in the hope that benefits will flow to the ecosystem via reduced diversions, it will be disappointed. Instead, as a result of SWP contract rules, the saved water would largely flow to other contractors. In effect, a public investment in efficiency would have been converted into a water subsidy for other SWP contractors.

For this reason, it would be far preferable for CALFED to use its efficiency funds as investments rather than subsidies in return for an assurance of public benefits. Thus, for example, CALFED could invest in a reclamation project or toilet retrofit in southern California for a share of the saved water to be delivered to the EWA.

There is another benefit to looking at CALFED efficiency investments as market transactions. CALFED's current approach is to fund only efficiency improvements that are not cost effective at the local level. That is CALFED will exclusively fund the most expensive efficiency programs. But under a market paradigm, CALFED could fund any project, provided that the benefit stream to CALFED justifies the cost. This shift in emphasis would allow CALFED to get more benefits at less cost without being accused of providing public funds for local benefits.

CALFED should consider agricultural water conservation alternatives predicated upon an economic definition of efficiency. In the PEIS/EIR, CALFED defines irrigation efficiency solely in terms of the fraction of water that is "beneficially used". Consequently, the conservation potential is limited to reduction in losses to salt sinks, inaccessible or degraded aquifers, or the atmosphere. But efficiency can also be understood as a measure of economic performance. From that vantage point, agricultural water use efficiency is defined as **the volume of irrigation water consumed, divided by the market value of the farm products derived from that water (or, more pertinently, by the farm *profits).*** Thus defined, the potential for efficiency improvements in the use of water in agriculture becomes quite large because the field of water conservation practices enlarges to include moving water from low value applications to higher value applications. This is illustrated by the fact that 20% of agricultural water use is applied to crops that provide only 4% of annual crop value. Stated another way, a vigorous agricultural water conservation program could be constructed under a guarantee to California agriculture that its current level of profitability would be maintained while allowing some fraction of water now used to

produce that profit to become available for unmet needs in other sectors, including the environment.

This alternative scenario for improving agricultural efficiency should be analyzed in the final EIS/EIR. Presumably, the water supply reliability strategy adopted in the Record of Decision will be the product of analyses of both supply and conservation alternatives. It is hard to see how the imperative under NEPA/CEQA/CWA § 404 to compare a range of reasonable alternatives can be satisfied without considering an agricultural water conservation alternative defined in terms of improvements in the economic efficiency of water use in that sector. It is possible that comparison of that alternative with the current one would lead to its rejection as impractical or undesirable. That would be justified as long as that rejection is based on technically sound analysis. What is not justifiable under the NEPA/CEQA/CWA § 404 processes is rejection based on unexamined preconceptions.

CALFED fails to consider alternatives for increasing dry year water supplies by linking water conservation to storage. While this document recognizes the potential of using **recovered losses** to improve water supply reliability in drier years, it fails to analyze that potential. Water tends to be more valuable in most sectors and for most purposes in drier years than in wetter years. Over-application of irrigation water that recharges usable groundwater may represent a recoverable loss. But the time to recharge aquifers is during years of relative abundance, not years of relative scarcity when that water is needed for immediate consumptive uses or to maintain minimum stream flows. There are substantial potential water supply reliability benefits to conservation measures that reduce losses in dry years. But, most such conservation measures cannot be readily switched on or off depending on the water year type. Rather, water conservation measures should be implemented on farms and in conveyance system in all year types. In drier years, that conserved water can be used to meet otherwise unmet needs. In wetter years, the conserved water can be stored (e.g., banked in groundwater storage sites) for recovery in drier years when it can provide the greatest value. What we suggest here is a purposeful, time-sensitive groundwater recharge program, rather than an accidental one.

The same analysis applies to all other incidental beneficiaries of recoverable losses, such as downstream water users and aquatic environments. In most cases, that water is more valuable to such users in drier years than in wetter years. Conservation tied to storage should provide a net improvement in water supply reliability for all users. CalFed has not analyzed the water supply reliability benefits of this kind of water conservation program linked to groundwater banking.

E. Delta Storage

The CALFED DNCT has postulated the existence of a particular Delta storage configuration during its simulation exercises. In particular, the DNCT has looked at:

- The creation of storage within Bacon, Woodward, and Victoria Islands.
- The installation of high volume diversion facilities on one or more of these islands.

- A direct physical connection between these islands and Clifton Court Forebay and/or the Tracy pumping plant.

We are concerned that the existing description on storage and diversion alternatives may not include this scenario within its envelope. Since the creation of this kind of diversion/ storage complex is a reasonably likely outcome of the CALFED Program, the PEIS should describe these options and their impacts with enough detail to avoid the need for additional programmatic work at a later date.

F. Environmental Water Account

NHI is very supportive of the EWA concept. However, the value of that concept will be determined by the manner in which the EWA is implemented. CALFED should consider the following points as it moves toward EWA implementation:

- EWA operations cannot and should not be divorced from:
  - The ERP water purchase program.
  - The CALFED habitat improvement program.
  - The CVPIA b(1), b(2), and b(3) programs.

- This implies that:

  - A single institution (once called the Delta Ecosystem Restoration Authority within CALFED) should manage both the flow and non flow parts of the ecosystem program
  - Funding should be able to move either from the habitat measures to the flow program or vice versa in order to allow investments in ecosystem restoration to pay the highest returns.
  - CVPIA water must effectively be managed as part of the EWA (either through a transfer of assets or through tight coordination).

  - Any expansion of infrastructure to allow greater water deliveries to water users is likely both to have intrinsic environmental impacts and to reduce the utility of any given level of EWA assets. This implies that the EWA must grow as system infrastructure grows. Without this kind of feedback loop, the ability of the EWA to provide environmental enhancement will decline over time.

  - The EWA funding stream must be predictable if it is to take on debt, purchase options, invest in infrastructure, or invest in efficiency. This implies that EWA funding cannot depend upon annual appropriations from the legislature and Congress. Either the EWA must be given an adequate endowment to allow a predictable annual income, or funding must be based upon some sort of user fee.

G. Ecosystem Restoration Plan

The Ecosystem Restoration Plan remains disorganized and lacks scientific justification, over a year and a half after the criticisms of the independent scientific review panel. The document still fails to satisfactorily adopt the six basic recommendations of that panel. The stakeholder-initiated Strategic Plan represents the only significant progress since the initial draft of the ERPP. CALFED has even marred that signal example of successful stakeholder engagement by simply editing the original version of the strategic plan and then simply ignoring it in Volumes I and II of the ERPP. This makes a mockery of stakeholder participation and leaves this central element of the CALFED plan seriously flawed. NHI suggests that CALFED either adopt the original version of the Strategic Plan as drafted by the Core Team or retain the Core Team to consider whatever revisions the CALFED staff wish to propose. *If CALFED is unwilling to take either of these steps, we believe the final EIS/EIR must explain the rationale for substituting the revised Strategic Plan for the original version (September 1998), which was drafted by six of California's most respected ecosystem scientists and planners.*

Muddle of Objectives

The core team of scientists that developed the strategic plan developed a clear set of goals and measurable objectives to guide the priorities of the restoration program. Although not sufficiently comprehensive, the list of objectives was clear and the strategic plan articulated a logical path for refining them and specifying additional objectives over time. CALFED staff has unfortunately mixed the strategic plan objectives with many vague or less important objectives. As a result, by one count the program now has over 140 objectives. Many of the objectives are confusingly redundant, uselessly vague or comparatively unimportant. This creates a muddle of "strategic objectives, strategic sub-objectives, and long-term and short term objectives." CALFED should simply reduce the number of redundant objective statements and then list all objectives under each of the six goal statements in an executive summary section.

The ERPP must specify criteria and a process for selecting and prioritizing restoration opportunities and Stage 1 Actions

As we stated in our comments to the original version of the ERPP (November 1997), the ERPP does not the describe criteria and a process for selecting and prioritizing restoration opportunities. The original unedited draft of the Strategic Plan (September 1998) by the core team of independent scientists emphasized the importance of utilizing selection criteria for nominating, evaluating, and selecting ERP actions for stage 1 implementation. The core team stated that it is important to: "(1) introduce new criteria designed to help make Stage I ecosystem-based and adaptive, and (2) suggest a process for further evaluating both previously proposed and newly proposed actions". To our knowledge, CALFED never developed explicit criteria to screen or prioritize the universe of potential restoration projects. Rather, it seems that CALFED staff simply selected a list of projects and then attempted to rationalize them. Although some stage 1 projects appear misguided to NHI, the focus of our criticism is directed at the lack of process for

selecting the actions rather than the actions themselves. Many of the proposed actions are worthwhile, but many other worthwhile projects were not included. It is not apparent that these were considered or evaluated according to a rationale selection process or criteria. More detailed comments on stage 1 actions are provided in the Delta section of our comments.

Even with a large budget, the list of desired restoration activities will far outstrip the available financial resources. To be useful, the plan must provide a basis for winnowing the more essential from the less essential, and, since the ERPP cannot undertake every winner simultaneously, a process for sequencing and prioritizing. The selection and prioritization principles around which a working consensus might coalesce might include the following obvious ones:

- **Learning potential:** Projects should be designed specifically to address critical knowledge gaps pertinent to broader application of restoration techniques.

- **Fungibility:** The restoration program should invest in ecosystem assets (land, water) that can be exchanged as priorities evolve.

- **Reversibility/Conservation:** Projects that prevent relatively irreversible changes to the landscape such as urbanization, fragmentation, exotic species invasions, or conversion to perennial crops should be prioritized.

- **Comparative Cost Effectiveness:** Projects should yield the greatest benefits per unit of investment in achieving the restoration goals and objectives.

- **Restorability: Restorability:** Projects that truly restore or protect natural process, functions or character, or come close should be favored.

- **Feasibility/Ripeness:** Projects that can be achieved in the near term without countervailing adverse consequences should be favored.

- **Sustainability:** Projects that are self-sustaining should be preferred over those that require significant maintenance.

- **Leverage:** Projects that have the potential to leverage an initial public investment into a larger effort for ecosystem benefits are desired.

Volume I and II of the ERP should be viewed as Illustrative rather than Definitive

The ecosystem targets and actions described in Volumes I & II as well as the stage 1 plan were generally not selected according to the methodical scientific process recommended by the independent scientific review panel and described in the strategic plan. As a result, many of the actions described in Volume I and II are not scientifically based and may ultimately limit the scope of the restoration program to a set of ineffective actions.

In fact, the original unedited version of the strategic plan states, "none of the proposed actions contained in Volumes I and II of the Ecosystem Restoration Program Plan were evaluated within the context of the adaptive management approach recommended for the ERP." This statement is still accurate since very little of Volumes I and II were substantially redrafted since the strategic plan was initially released.

The strategic plan provides a reasonably clear explanation of the process by which targets and actions will be changed over the life of the project as our understanding of the ecosystem improves over time. But it is unclear whether target and actions described in Volume I & II limit the scope of future restoration actions or are simply examples of the types of that the restoration program will include. As currently drafted, it appears that Volume I & II constitute the full scope or "book ends" of the restoration program. This is a problem, because there is no assurance or scientific basis for assuming that the actions described in Volumes I & II will actually achieve the goals and objectives of the ERPP. *Does CALFED consider the specific targets listed in the ERPP as "bookends" or limits on the scope and area of restoration actions?*

The ERPP's restoration targets are too modest

The independent scientific review panel recognized that water and land restoration must be the key elements of CALFED's ecosystem restoration program, yet CALFED proposes to restore less than 150,000 acres of land – less than two percent of the 6,835,000 acres of farmland in the primary solution area. The ERPP's anemic proposal for restoring less than 6,000 acres out of 3,750,000, 0.16% of farmland in the San Joaquin River region is particularly scant. We fail to understand how CALFED will achieve any meaningful restoration objectives with such anemic restoration proposals. In light of the fact that land restoration must be a key element of the restoration program, NHI suggests that CALFED considerably expand land acquisition program. We expect that significantly expanding the proposed land restoration targets will not significantly alter CALFED's land use and agricultural impact analysis (see impact analysis comments and previous section).

In many cases, ERPP targets are already required by existing laws or already being implemented by pre-existing programs. For example, the flow restoration Targets for the Tuolumne River are already mandated by FERC while the flow targets specified for the Merced River are below those required by Davis Grunsky. The entire premise of the CALFED ecosystem restoration program is to identify restorative actions above and beyond existing law in order to reduce the conflicts imposed on the water system by endangered species.

The ERPP's vision for restoration of the Delta is also disappointingly modest and limiting. Over 95% of the Delta's riparian and wetland habitats have been destroyed or fragmented. The ERPP acknowledges that the Delta is the ecological hub of the Central Valley bioregion, yet it proposes to restore less than 10% of the Delta to tidal marsh habitat types over the next 25 years. This is not going to be enough to secure the long-term survival of many native species needing contiguous habitat areas. The Delta is the

only place where large contiguous areas of aquatic, marsh, and riparian habitat types can be restored. In the Delta, the low land values, lack of urbanization, large parcel sizes, continued flooding, subsidence problems, and proximity to endangered species present a unique opportunity for restoring vast areas over the next 25 years.

To the extent one can infer any rationale for the paltry target here proposed, it seems an entirely unscientific one. Basically, we are given to understand that only about 12% of the tidally influenced lands in the Delta are considered worthy of restoration to tidal marsh because a 1906 map of the Delta shows about this percentage of marsh remaining and, at that time, when the fishery was in reasonably good shape. Thus, the logic goes, if we restore to the 1906 marker, the fish will come back. Why 1906 is thought to be the optimal marker, rather than 1956 or 1856 is not explained. Apparently, there is no better reason than that a map of that date happens to be in the possession of the CALFED staff. In the intervening decades, of course, the hydrodynamics and species composition of Delta has been utterly transformed by human actions. Since the clock is not to be turned back on these alternations, there is no good reason to think that this extent of marsh restoration will produce a 1906 level of fishery benefits.

But the problem with the analysis is much more fundamental. Clearly, as the independent scientific review panel stated, where habitat is concerned, more is always better than less. The real constraints on how much tidal marsh to reconstruct in the Delta and where are not a function of some historical marker or some preconceptions as to how many fish are enough. They are set by the wholly practical considerations such as where and how much of the subsided lands can be elevated to near sea level and at what cost, how much and where the levee system is most vulnerable to catastrophic failure due to seismic events, how much and where the full costs of levee maintenance and fish screening make continuation of present land uses unsustainable, how much and where habitat benefits can be obtained for favored species, and the extent to which and where there are willing sellers of the private lands in the Delta. In short, the EIS/EIR should present an ERPP that specifies the restoration targets on the basis of analysis of costs and opportunities rather than just some arbitrary historic period. Rather than consider these factors, the ERPP simply assumes that it will be impossible to restore subsided lands to tidal marsh or shallow water habitat.

The real explanation for the ERPP's modest tidal marsh target may well be the concern that the private landowners in the Delta would object to a more ambitious restoration program. NHI also believes that a feasible Delta restoration program must be acceptable to the Delta landowners. Indeed, we think the best restoration program would be one that is home grown--developed by the Delta residents and the environmental beneficiaries together. We have been working to this end. The key point here is that the extent to which private lands will be converted to habitat is entirely within the control of these private landowners and this will remain so. What the ERPP needs to do is develop a program of incentives that makes it attractive to these owners to embrace, and indeed initiate, restoration projects on as broad a scale as practicable. Of course, one of those practical constraints is the opportunity costs at various levels of restoration effort, just as is the case for all other restoration options. (See comment # 2 above). But starting with

arbitrary limits based upon some unarticulated political premise simply undermines the ERPP as a serious effort.

The map of low conflict restoration opportunities that we developed along with the Delta Protection Commission and representatives from local Delta Water Agencies (figure 12, in the Environmental Optimal, and Appendix H of the Long Term Levee Protection Plan) should be included in the ERPP. It delineates 165,000 acres of land considered suitable for habitat restoration not including tens of thousands of acres of other lands that are suitable for wildlife friendly agriculture. Despite the large geographic area of low conflict restoration opportunities depicted in the map, the map was viewed by both NHI and Delta interests as near-term low conflict restoration opportunities – not a recommendation on the scope and magnitude of the final restoration program after 30 years. Indeed, it is not possible to specify optimum long-term plan for habitat restoration at this time. Rather CALFED should embrace a flexible approach that allows them to expand or constrain the program over time as science and social preference dictate.

Restoration Targets and Actions Are Arbitrary and Overly Limiting

In our comments to the initial EIR, NHI emphasized that **the ERPP should place more emphasis on the restoration planning process and less emphasis on specific restoration targets and actions.** In recognition of the tremendous uncertainty regarding actions necessary to improve ecosystem elements, CALFED has correctly embraced the adaptive management planning process. Unfortunately, the ERPP does not articulate an adaptive management process. Rather, CALFED has ignored the real level of uncertainty about how to restore the ecosystem and simply identified several unsubstantiated and seemingly arbitrary restoration targets and actions. Our specific comments regarding the East San Joaquin Tributaries ecological zone demonstrate the folly of specifying overly narrow and often arbitrary targets and actions. CALFED should delete specific targets unless there is a strong scientific basis for them and replace the target with a broader range of potential restoration actions.

We suspect that that CALFED has prematurely identified specific targets and actions in order to produce an environmental document that would comply with CEQA and NEPA. ERPP is intended to be a programmatic document, and it is not possible or wise to develop highly specific targets at this level. For the purposes of quantifying the relative costs and benefits of the ERPP, CALFED should identify the broad range of effort potentially necessary to achieve implementation objectives. For example, to achieve the implementation objective associated with stream flows on the Stanislaus River, the ERPP should estimate a range of potential target flows necessary to mobilize gravel such as "an average release of between 6,000 and 12,000 c.f.s. for a 10 day period." ERPP should qualify this statement with the caveat that the exact flow necessary to mobilize the bed will be determined through an adaptive management program. The final cost/benefit analysis can then be based on the costs and benefits that would accrue at the lower, middle, and upper end of the range of targets. The purpose of this exercise is to provide an analysis of costs and benefits over a broad range of effort. There is ample precedent for using this approach in programmatic environmental documents. Rather than

the ERP restoration targets are above and beyond CVPIA and other program targets (additive) or whether the ERP targets include all restoration actions contemplated in these other programs?

Delta Restoration Vision and Stage 1 Actions

One of the greatest threats to the Delta is urbanization from nearly all-surrounding communities – Sacramento, Stockton, Lathrop, Manteca, Tracy, Brentwood, and Oakley. Many lands on the periphery of the Delta are at imminent risk of urbanization. We agree with CALFED's plan to work with farmers to protect wildlife friendly agricultural lands, but we think that this activity should be elevated to a stage 1 action and concentrated in the Delta Secondary zone. If CALFED does not elevate this activity to a stage 1 action, many lands along the periphery of the Delta will be urbanized, and ecosystem restoration opportunities will be irreversibly lost.

It is obvious for reviewing the stage 1 actions that CALFED has not consulted the necessary experts to identify and explain priority actions. In several cases CALFED has simply missed worthwhile stage 1 actions. For example, action 1 in the Delta Section (D-4) calls for increasing the *duration* of flooding in the Yolo Bypass in winter and spring. Although increasing the duration of flooding may be worthwhile, it is probably more important to increase the *frequency* of flooding particularly in dry years, because prolonged periods without inundation may leave the endangered Sacramento splittail with no place to spawn. The splittail only needs flooded conditions for six weeks in January and February – not during spring months as described in the stage 1 actions. Action 3 for the Delta (D-5) recommends widening the Tule Canal/Toe Drain. Why does the toe drain need to be widened? Is there any evidence that the width of the toe drain limits migration of fish? Our understanding is that the toe drain can already convey 10,000 c.f.s. (Ted Sommer, pers com 1999). If anything, the toe drain conveyance capacity should be reduced to increase overbank flooding favored by many native fishes.

Pg. D-5 Actions 6, 8, and 9 propose wetland restoration on Little Holland Tract, Liberty Island, and the lower Yolo Bypass respectively. These areas have recently been identified as mercury hot spots by the U.C. Davis study funded by CALFED. Creation of wetlands could reopen biological pathway for methylated mercury – causing significant adverse impacts for the North Delta ecosystem. While these actions represent some of the easiest opportunities for large scale restoration, the most prudent course of action would be to delay these actions in favor of some other actions that are more pressing.

All of these proposed actions are located in the Yolo bypass, a dedicated floodway that will never be developed. CALFED can be assured that the opportunity for restoring these areas will not be diminished by time. In other areas of the Delta, restoration opportunities will be lost in the near future due to the pace of urbanization.

One of the best examples of a restoration opportunity that may soon be lost to urbanization is tidal marsh restoration on the southern shore of Big Break in North East

Contra Costa County. Numerous scientists and restoration planners have visited the site and affirmed its high potential for tidal marsh restoration, yet CALFED never considered including it on the stage 1 list[5]. This is particularly disappointing since CALFED has claimed that it will utilize the north delta sites to study the relationship between salinity gradients, salinity variability, and physical habitat – a research need identified by the Core Team. Salinity gradients and variability are very small or non-existent in the north Delta. The western delta is the best place to study the effects of salinity variability and Big Break is one of the few sites where short-term restoration is possible in the West Delta.

Central and West Delta Stage 1 actions: Action 1 proposes restoring a mosaic of habitat types on Franks Tract using clean dredged materials. This may be a worthwhile project, but it will require very large volumes of dredged material that may be more efficiently used elsewhere. The idea of restoring already inundated habitat to tidal marsh is sound, but why is Franks tract the only site under evaluation? It may be possible to restore more productive wetlands with less fill and for less money at Big Break. Before CALFED implements this action on Franks Tract, it should comparatively evaluate it against the benefits and costs of other opportunities for restoring tidal marsh at other open water areas such as Big Break.

East San Joaquin Basin

Pg. 433: The flow regimes specified for the East San Joaquin Tributaries are an example of the inconsistent and poorly reasoned approach that was apparently utilized to outline the restoration program described in the ERP. Although the Tuolumne (1.95 maf) is significantly larger than the Stanislaus (1.2 maf) and Merced (1.02) rivers, the three systems share similar geology, watersheds, hydrology, and aquatic species yet the flow recommendations for each river (which are nothing more than existing law on the Tuolumne and less than existing law on the Merced[6]) vary widely. Table **X below** depicts the CALFED flow recommendations for these three rivers for above average-wet years. Presumably, the recommended flows are intended to meet strategic ecological objectives such as restoring salmon populations, yet there is no explanation why 25 c.f.s. on the Merced is an adequate summer flow while 300-1,500 is deemed necessary on the Stanislaus.

The recommended spring peak flows for each river are more consistent, but there is no scientific basis for determining whether they are adequate for achieving objectives associated with high flows such as maintaining dynamic channel processes, channel complexity, bed sediment quality, and natural riparian habitats. The rationale statements claim that these "pulse" flows would help to restore natural stream processes; gravel

[5] NHI has identified the Big Break site as a prime restoration opportunity and invited CALFED staff to visit the site on numerous occasions, but CALFED staff have declined.

[6] The ERP Volume 2, pg. 432 states that the Davis-Grunsky contract requires Merced Irrigation District to maintain a continuours flow of between 180cfs and 220 cfs in the lower Merced River from November 1 through April 1, yet pg. 434 of the ERP recommends minimum flows in normal years of "25 cfs from June through October 15, 60 cfs from October 15, 75 cfs from October 16 through October 31 and January through May and 100 cfs in November and December.

recruitment, cleansing, and transport; and riparian vegetation development and survival. But it is obvious, for example, that dry year pulse flows of 1,000 to 1,500 c.f.s will not transport, recruit, or clean gravel. As we said in our comments to the initial ERP draft (November 1997) achieving these geomorphic objectives generally requires a threshold flow necessary to mobilize the channel bed. Peak flows below this threshold do nothing to achieve stated geomorphic objectives and may even be a harmful waste of water. Our understanding of these systems suggest that even the maximum recommended flows of 4,000 – 6,000 c.f.s on these rivers are not sufficient to meet the needs of maintaining a healthy riparian ecosystem[7]. Rather flows closer to the natural mean annual flood (10,000 – 14,000) c.f.s may be necessary to achieve stated geomorphic objectives on these rivers. Furthermore, peak flows of 4,000-6,000 c.f.s that do not go overbank may perpetuate channel incision and reduce channel complexity overtime.

Table 1: Flow Recommendations for East San Joaquin Tributaries

	Merced (normal to wet) (c.f.s.)	**Tuolumne (normal to wet) (c.f.s.)**	**Stanislaus (normal to wet) (c.f.s.)**
OCT 1-15	25	300	300-400
OCT 16-31	75	696.6667	300-400
NOV	100	300	300-400
DEC	100	300	300-400
JAN	75	300	300-400
FEB	75	300	300-400
MAR	75	300	300-400
APR	75	2297	1,500
MAY	75	1298	1,500
JUN	25	250	800-1,500
JUL	25	250	300-400
AUG	25	250	300-400
SEPT	25	250	300-400
Spring Peak	3,000-4,000		3,000-4,000

The flow regimes specified for the Tuolumne and Merced Rivers are already required by law. If the CALFED plan for flows on the Tuolumne and Merced River is to do nothing more than existing law, then they should simply state that CALFED plans to do nothing to augment flows on the Tuolumne and Merced rivers.

[7] On page 439, the ERP acknowledges that "the present channel capacity of the Tuolumne River is about 9,000 cfs which is not large enough to meet the needs of maintaining a healthy alluvial river ecosystem.

The diversity year classification for stream flow restoration targets (depicted in table 2) is indicative of the inconsistent and arbitrary approach apparently utilized by CALFED to select restoration targets and actions. *Why are multiple year class selections utilized on different tributaries to identify flow restoration targets?*

Table 2: Inconsistent Year Classifications for East San Joaquin Tributaries

Stanislaus	Tuolumne	Merced
• Critical, dry, and below normal • Above-normal • wet	• critical and below • median critical dry • intermediate critical dry • median dry • intermediate dry-below normal • median below normal • all other year types (intermediate below normal/above normal, median above normal, intermediate above normal-wet, and median wet/maximum years	• dry years • normal years

Pg. 437 Coarse Sediment Supply: Target

The stated rationale for coarse sediment supply actions states that incorrectly states "gravel transport is the process whereby flows carry away finer sediments that fill gravel interstices (spaces between cobbles. Gravel cleansing is the process whereby flows transport, grade and scour gravel." In actuality gravel transport is the process whereby flows transport, grade and scour gravel. It is important to recognize that it is generally impossible to clean fine sediments from the gravel interstices without actually mobilizing the gravel (Kondolf and Wilcock, 1998). Even though the definition of gravel transport explicitly involves flows transporting water and changing water flows (i.e. large peak flow releases) is identified as an opportunity for restoring gravel conditions necessary for spawning, actual changes in flows are not listed as a programmatic action for improving coarse sediment supply. Rather the only actions listed are studies for evaluating whether gravel augmentation programs to improve spawning habitat below major dams are necessary. Gravel augmentation may be necessary, but in the absence of restoring flows sufficient to transport gravel, it does not constitute restoration of ecological processes.

Pg. 438 Stream Meander: The target for preserving and expanding stream meander belts on the East Side San Joaquin Tributaries – adding a cumulative total of 1,000 acres on all 3 tributaries – is probably insufficient to achieve the stream meander objective. We suggest increasing the target to a range of 1,000 – 10,000 acres on all 3 tributaries.

Programmatic action 1B proposes establishing a mechanism through which property owners would be reimbursed for lands lost to natural meander processes. We support this approach but our concerned that such a program may end up compensating private interests for the acquisition of property already controlled or owned by the state. The state holds fee title to the beds of all navigable rivers and holds a public trust easement on their banks. Any land that becomes part of the bed or bank of the river through natural meander migration becomes the property of the state. *Does CAFED intend to purchase riparian lands that are already owned by the state? If not, what mechanism will CALFED utilize to ensure that CALFED funds are not used to incorrectly compensate private parties for the acquisition of lands already owned or controlled by the state?*

Pg. 440 Central Valley Stream Temperatures: The temperature targets seem unnatural. The target calls for spring temperatures that are five degrees warmer than summer temperatures. Summer temperatures on these streams probably exceeded 60 degrees in the summer months and were certainly greater than pre settlement springtime water temperatures. The diversity of the aquatic community is shaped by natural variation in stream temperatures. Unnatural variation in stream temperatures proposed by CALFED and the Fish and Game Code may be harmful or unnecessarily expensive to attain.

Pg. 442, water diversions: The target for this section is to screen 50% of the water volume diverted in the basin. The rationale section states that entrainment losses at pumps are unknown. Screens are expensive to maintain and install. *Why does CALFED plan to screen 50% of the diversions if the entrainment losses at those diversions are unknown? Has CALFED considered alternatives to screening? If so, what type of alternatives have they considered?*

<u>San Joaquin River Mainstem Restoration</u>

The revised phase two report states that "CALFED will give consideration to restoring salmon runs below Friant Dam on the San Joaquin River as a means of attaining ERP goal. CALFED will evaluate fishery restoration in the mainstem San Joaquin River as a part of the ERP, while keeping in mind the specific hydrological and water management considerations in the San Joaquin Basin." NHI applauds CALFED for agreeing to consider restoring salmon to the San Joaquin River, and we urge CALFED to go a step further and commit to restoring salmon to the river. *What are the specific hydrological and water management considerations in the San Joaquin Basin that CALFED refers to on page 39 of the revised phase II document?*

Although the phase II document commits to considering opportunities for salmon restoration below Friant Dam, the ERP chapter on the mainstem San Joaquin seems to ignore opportunities for restoring salmon. On page 386, "the vision for the Mendota Pool

to Gravelly Ford Ecological Management Unit includes no significant tributary inflow." Since this reach is often dry during the spawning immigration season, it will be possible to restore salmon without a significant increase of instream flows in this reach. *Does CALFED plan to evaluate opportunities for rewatering this reach? If so what actions will they take to evaluate these opportunities?*

Many of the restoration targets are incorrectly or inappropriately limited to downstream of the Merced River, even though many of the actions described are upstream of the Merced River. CALFED should expand the geographic scope of these targets to include the entire river from Vernalis to Friant Dam rather than just Vernalis to the mouth of the Merced.

Pg. 398,Stream Meander: The target for this section reads "restore and maintain a defined stream-meander zone on the San Joaquin River between Vernalis and the mouth of the Merced River," but action 1b "establish a river meander corridor between the Chowchilla Bypass and Mendota Pool" is significantly upstream of the Merced River

Pg. 398, Natural Floodplain and Flood Processes: The geographic scope of the target is limited to the area downstream of the Merced River, yet the second paragraph of the rationale section describes the West Bear Creek Floodplain Restoration project upstream of the Merced as an example. The third paragraph of the rationale cites opportunities described in a study of the river upstream of the Merced River conducted by the San Joaquin River Riparian Habitat Restoration Program. Obviously, there are many excellent opportunities for attaining floodplain and flood process objectives upstream of the Merced River. CALFED should expand the geographic scope of this target to include the entire river from Vernalis to Friant Dam rather than just Vernalis to the mouth of the Merced.

Pg. 399, Central Valley Stream Temperatures: Again the geographic scope of the target is limited to areas downstream of the Merced River, but there are many actions that could be taken upstream of the Merced River to lower water temperatures downstream of the Merced. CALFED should expand the geographic scope of this target to include the entire river from Vernalis to Friant Dam rather than just Vernalis to the mouth of the Merced.

Pg. 402, Water diversions, programmatic action 2A: This action should be considered an interim action until suitable salmon migration and spawning conditions are restored on the San Joaquin River below Friant Dam. The Department of Fish and Game has been installing a temporary barrier at Hills Ferry, just upstream of the Merced, of and on since 1949. This program is clearly an ongoing program and should not be funded by CALFED. *Does CALFED intend to divert ERP dollars to fund existing state programs such as the Hill Ferry Salmon Barrier on the San Joaquin River?*

Pg. 402, Levees, Bridges, and Bank Protection: Again the ERP limits the geographic scope of this target to the area downstream of the Merced River, yet the rationale for this action relies heavily on project descriptions and studies from upstream of the Merced

River. CALFED should expand the geographic scope of this target to include the entire river from Vernalis to Friant Dam rather than just Vernalis to the mouth of the Merced.

Pg. 397, Coarse Sediment Supply: We applaud CALFED for protecting committing to protect coarse sediment supplies below Friant Dam. This is essential for maintaining the opportunity to restore anadromous fish to that reach. CALFED says that it will develop a cooperative incentive program to relocate gravel mining from the active floodplain. *What does CALFED mean by active floodplain*? Friant Dam has greatly diminished the frequency of floods and in many cases gravel mining has caused channel incision, preventing the historical mean annual flood from inundating the flood plain. Even though these surfaces are rarely inundated, gravel mining upon them adjacent to the stream could be harmful to the long-term restoration of the system. CALFED should define the active floodplain as the present day 100-year floodplain.

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